

# RANCANGAN KAJIAN FAKTOR USAHA DALAM MEMBANGUN PANDUAN PENGEMBANGAN PERANGKAT LUNAK SEDERHANA, AKURAT, DAN DINAMIS

Rizky Parluka

Program Studi Teknik Informatika Fakultas Teknologi Industri

Universitas Pembangunan Nasional "Veteran" Jawa Timur

Jl. Raya Rungkut Madya, Gunung Anyar, Surabaya, Jawa Timur 60294

Email : [rizky\\_file@yahoo.com](mailto:rizky_file@yahoo.com)

**Abstrak.** *Panduan dalam membangun Perangkat Lunak (selanjutnya disebut PL) yang sederhana, akurat, dan dinamis merupakan sebuah proses pemikiran yang kompleks. Banyak faktor yang mempengaruhinya diantaranya adalah usaha (biaya, waktu, dan tim), konsep, metode, kondisi, dan lingkungan pengembangan PL. Usaha PL dan proses estimasi biaya dalam proyek rekayasa PL merupakan komponen yang sangat penting. Keberhasilan atau kegagalan proyek sangat tergantung pada keakuratan usaha dan jadwal estimasi(5). Manajemen proyek perangkat lunak adalah salah satu kegiatan penting dalam proses pengembangan PL. Banyak proyek pengembangan PL gagal karena buruknya pengelolaan proyek. Tujuan utama dari software tim manajemen proyek adalah untuk menghitung apa yang perlu dihitung, mengukur apa yang perlu diukur dan mempersiapkan parameter terukur untuk terus memantau dan mengelola proyek pengembangan PL(11). Estimasi usaha PL adalah salah satu yang penting pada tahap awal dari siklus hidup pengembangan PL, khususnya ketika rincian persyaratan tidak dapat diidentifikasi dengan jelas(13).*

**Kata Kunci:** *Fuzzy Tahani, Sistem Pendukung Keputusan, Penilaian Kinerja*

Penulis dalam penelitian sebelumnya mencoba melakukan pengukuran terhadap manfaat penggunaan komponen pada pengembangan PL menggunakan metrik *Function Point* dan algoritma *Bayesian Network*. Dalam Tesis tersebut penulis hanya mengkhususkan pengukuran pada perbandingan efektifitas penggunaan komponen dalam kaitannya dengan faktor usaha dalam pengembangan PL, untuk dapat memprediksi biaya pengembangan PL seakurat mungkin pada proyek PL dengan skala kecil, menengah, dan besar. Namun setelah penulis cermati kembali, hasil penelitian tersebut seyogyanya masih dapat dikembangkan lebih lanjut terutama pada kajian terhadap faktor usaha pengembangan PL.

Adapun hal yang penulis ingin ketahui antara lain:

1. Bagaimana bila setiap atribut PL dapat dijabarkan hingga ke bagian yang lebih detail
2. Dari sisi metrik yang digunakan, variasi penggunaan metrik lain yang masih dapat ditoleransi akurasi hingga saat ini, akan memberikan hasil perhitungan yang lebih terukur(49-55).
3. Dari sisi Standar Penggajian, pada penelitian terdahulu hanya

menggunakan Kelly Services Indonesia (2015). Bagaimana bila divariasikan dengan standar-standar lainnya seperti Robert Walters Indonesia (2015), Jatimprov, (2015), maupun standar lain yang layak digunakan sebagai acuan dalam bidang pekerjaan proyek PL.

4. Dari sisi kapasitas personal tim, penempatan posisi anggota tim dengan kualifikasi pendidikan Strata, Pengalaman, dan Jabatan dalam Proyek PL belum terbagi secara spesifik dan proporsional(51, hal 49).
5. Dari sisi model penggajian personal tim, pada penelitian sebelumnya hanya dihitung per bulan, bagaimana bila dapat dihitung per Jam, per hari, per minggu, per fungsi (51,hal 8), per komponen, per framework, dan lain sebagainya dengan mengacu pada hasil kajian literatur.
6. Pada penelitian sebelumnya dataset proyek PL yang didapatkan penulis maksimal hanya bernilai 100 Juta rupiah, bagaimana bila nilai proyek PL yang akan dikerjakan diatas 1 Milyar seperti pada dua procurement yang dilampirkan penulis.
7. Dari sisi teknis pemrograman, dimana pada penelitian sebelumnya tidak

dimunculkan karena yang diukur adalah fungsionalitasnya saja tanpa memperhatikan teknis bahasa pemrograman yang dipakai, lingkungan, serta kondisi proyek PL ketika sedang dibangun.

8. Dari data rekap 100 skripsi mahasiswa S1 Teknik Informatika UPN Veteran Jawa Timur yang telah dibimbing penulis dalam kurun waktu 2008-2015, penulis menemukan implementasi teknis bahasa pemrograman, framework yang digunakan, dan DBMS yang digunakan, juga berpengaruh pada besar usaha yang diperlukan dalam membangun PL.
9. Dari sisi Model Proses PL, dalam penelitian sebelumnya Model *Waterfall* saja. Bagaimana bila model yang lain seperti *Evolutionary*, *RAD*, *XP*, dan lain sebagainya diterapkan pada studi kasus yang sama, apakah akan memberikan hasil yang lebih optimal atau tidak.

Bagaimana mewujudkan panduan dalam pengembangan PL yang mudah dipahami, terukur, dan berkesinambungan.

### Latar Belakang

Perkembangan PL dewasa ini telah sangat bervariasi. Hal ini dapat dilihat pada tren IT 2015 (gartner, 2014) yang terdiri atas *Computing Everywhere*, *The Internet of Things*, *3D Printing*, '*Advanced, Pervasive and Invisible Analytics*', *Context-Rich Systems*, *Smart Machines*, *Cloud/Client Computing*, *Software-Defined Applications and Infrastructure*, *Web-Scale IT*, dan *Risk-Based Security and Self-Protection*. Dari 10 tema tersebut penulis tertarik untuk membangun Panduan dalam merencanakan dan membangun Proyek PL bertemakan *Advanced, Pervasive and Invisible Analytics*'. Menurut (Gartner,2014) dalam tema ini, Analisis akan mengambil bagian utama pada volume data, melalui sebuah sistem yang tertanam didalam suatu aplikasi. Sekumpulan data baik terstruktur maupun tidak terstruktur, baik di dalam dan di luar organisasi akan dianalisis untuk kemudian memberikan informasi yang tepat kepada orang yang tepat, dan pada waktu yang tepat.

Penelitian ini akan membahas mengenai bagaimana merumuskan suatu kerangka kerja / panduan bagi pengembang PL, dengan sebelumnya melakukan studi literatur dan kajian terhadap faktor usaha pengembangan PL pada penelitian-penelitian sebelumnya. Pada penelitian ini penulis akan fokus menggali pada 3 isu utama pada kerangka kerja / panduan yang akan dibangun yakni *Sederhana*, *Terukur*, dan *Dinamis*.

**Sederhana** menurut asumsi penulis adalah bagaimana Panduan dapat dengan mudah untuk dipahami dan dioperasikan bila kemudian dibuatkan suatu kakas bantu yang membantu merepresentasikannya. Pada isu sederhana ini, harus jelas ranah pembahasan dan implementasi masing masing faktor pendukung PL seperti usaha, model pengembangan yang dilakukan, serta kondisi, dan lingkungan pada saat akan membangun perangkat lunak.

**Terukur** menurut asumsi penulis adalah bagaimana panduan dapat memberikan hasil yang seakurat mungkin dari hasil pengukuran, perhitungan, ataupun pembobotan dengan sebelumnya memperhatikan hasil implementasi beberapa metode untuk mengestimasi usaha pengembangan PL seperti *Fuzzy*, *Neural Network*, *Semantic*, (28) ataupun kombinasi dari beberapa metode bila diperlukan. Sebagai contoh bila nantinya perlu dilakukan pembobotan, maka masing -masing faktor pendukung PL seperti usaha, model pengembangan yang dilakukan, serta kondisi, dan lingkungan pada saat akan membangun perangkat lunak akan diberikan pembobotan dengan sebelumnya menentukan dasar pembobotan yang dapat dipertanggung jawabkan secara akademis.

**Dinamis** menurut Asumsi Penulis adalah bagaimana panduan setelah berhasil dikonsepsikan secara jelas, kemudian bila perlu dibangunlah sebuah kakas bantu sebagai simulasi maupun representasi dari panduan yang akan dibangun dan dapat diupdate pengetahuannya. Pengguna nantinya akan dapat mengupdate informasi yang spesifik dengan tentunya mengikuti struktur kerangka yang telah disusun. Nantinya dapat pula dibuatkan sekumpulan petunjuk berupa notasi-notasi maupun format-format dengan ekstensi tertentu yang berfungsi sebagai input tambahan pengetahuan yang mudah diintegrasikan ke dalam panduan, maupun kakas bantu.

**Perumusan Masalah**

Masalah yang akan dibahas dalam penelitian ini adalah:

1. Bagaimana menjabarkan faktor-faktor penentu keberhasilan pengembangan PL secara detail, terstruktur, dan sistematis?
2. Bagaimana memilih dan kemudian mengimplementasikan teknologi / metode, maupun permodelan yang tepat sesuai kondisi faktor-faktor pada butir (a)?
3. Bagaimana membangun Kerangka Kerja / Panduan yang sederhana, akurat, dan dinamis?
4. Bila pada butir (a).salah satu atau lebih faktor PL tidak diketahui oleh pengembang, Bagaimana memberikan masukan kepada Pengembang berdasar pengetahuan yang telah ada pada Kerangka Kerja / Panduan pada proyek PL yang sejenis?
5. Bagaimana mengimplementasikan suatu kakas bantu yang mampu mempresentasikan Kerangka Kerja / Panduan dari butir (a) sampai dengan butir (e)?
6. Bagaimana mengukur tingkat akurasi dari hasil keluaran kakas bantu pada butir (e) dengan metode yang sesuai?

Bagaimana mengukur validitas dari kerangka kerja / Panduan yang berhasil dibangun (butir (c)) maupun dari hasil uji coba kakas bantu pada butir (f) dengan

metode yang sesuai seperti kappa cohen, R-Table, dan lain sebagainya?

**Hipotesa**

Bila Atribut-atribut penyusun PL diinventarisasi secara detail, kemudian diterapkan Metode pengembangan PL yang terukur pada faktor usaha, maka akan didapatkan panduan pengembangan perangkat lunak yang sederhana, akurat, dan dinamis.

**Metodologi**

Dilakukan pemilihan terhadap pembahasan masing-masing literatur dalam kaitannya dengan faktor usaha dalam pengembangan proyek PL, dalam hal ini Adapun definisi yang dijadikan penulis sebagai constraint adalah sebagai berikut

1. Sederhana

Atribut-atribut penyusun proyek PL seperti usaha, tim, waktu, biaya, model pengembangan PL, dan metode yang digunakan dapat dengan mudah diidentifikasi dan telah jelas ranah pembahasan / implementasinya.

2. Akurat

Terdapat acuan / panduan yang jelas, serta adanya pengukuran dan perbandingan yang menyakinkan antara hasil pengukuran dengan acuan yg dipakai. Dapat juga diterapkan beberapa rumus matematik guna menentukan pola dari kajian.

3. Dinamis

Mampu mengadaptasi perubahan dan dapat ditambahkan pengetahuan tanpa merubah struktur utama.

Tabel 04. Pembagian literatur kedalam Konsep Sederhana, Akurat, dan Dinamis

Faktor	Literatur
Sederhana	3,4,6,9,11,14,15,17,19,20,21,22,25,26,27,28,29,30,31,54
Akurat	1,
Dinamis	2,
Sederhana dan Akurat	5,7,8,10,12,13,16,23,24,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69
Sederhana	Belum tersedia.
Akurat	Belum tersedia.
Sederhana, Akurat,	Belum tersedia.

**Daftar Pustaka****Faktor Usaha dalam Konsep Adaptive Software Development**

- [1] Barry, A.J.B., M., (2014), “ Situational Software Engineering Complex Adaptive Responses Of Software Development Team”, In Proceedings Of The 2014 Federated Conference On Computer Science And Information Systems Pp. 841–850, DOI: 10.15439/2014F196, ACSIS, Vol. 2, 978-83-60810-58-3/\$25.00 C 2014, IEEE.
- [2] Yeboah-Antwi, K. And Baudry, B., (2014), “ Embedding Adaptivity In Software Systems Using The Ecselr Framework”, In ACM 978-1-4503-3488-4/15/07., GECCO’15, July 11-15, 2015, Madrid, Spain.

**Faktor Usaha dalam Konsep Agile Software Development**

- [3] Chevers, D., A., (2014), “ Preliminary Study Of The Adoption Of Agile Software Development Methods In Jamaica Students’ Perspectives”, in International Journal of Education and Social Science www.ijessnet.com Vol. 1 No. 2; September 2014, pages 43-50.
- [4] Deepa Vijay, D., and Ganapathy, G., (2014), “ Guidelines To Minimize The Cost Of Software Quality In Agile Scrum Process”, in International Journal of Software Engineering & Applications (IJSEA), Vol.5, No.3, May 2014, DOI : 10.5121/ijsea.2014.5305.
- [5] Manga I and Blamah NV, (2014), “A Particle Swarm Optimization-Based Framework For Agile Software Effort Estimation”, in The International Journal Of Engineering And Science (IJES), Volume 3, Issue 6 Pages 30-36, 2014, ISSN (e): 2319 – 1813 ISSN (p): 2319 – 1805, www.theijes.com The IJES.
- [6] Manjula, R., and Thirumalai, R., S., (2015), “ Analysis Of Effort Estimation Model In Traditional And Agile”, in International Conference on Computing and Intelligence Systems Volume: 04, Special Issue: March 2015, Pages: 1181 – 1184 ISSN: 2278-2397, International

Journal of Computing Algorithm (IJCOA).

**Faktor Usaha dalam Konsep Software Analogy**

- [7] Ali Idri, A., Amzal, F., A., and Abran, A., (2014), “ Analogy-Based Software Development Effort Estimation A Systematic Mapping And Review”, in Contents lists available at ScienceDirect, Information and Software Technology, journal homepage: [www.elsevier.com/locate/infsof](http://www.elsevier.com/locate/infsof), \_ 2014 Elsevier B.V. All rights reserved.
- [8] [8] Azzeh, M., and Nassif, A., B., (2014), “ Analogy-Based Effort Estimation A New Method To Discover Set Of Analogies From Dataset Characteristics”, in IET Softw., 2015, Vol. 9, Iss. 2, pp. 39–50, doi: 10.1049/iet-sen.2013.0165, & The Institution of Engineering and Technology 2015, ISSN 1751-8806.
- [9] [9] Jayashree K., M., Bama S., B., Vijay, J., F., (2014), “ Software Effort Estimation Using Analogy”, in International Journal of Advanced Computational Engineering and Networking, ISSN: 2320-2106, Volume-2, Issue-5, May-2014, pages 23-25.

**Faktor Usaha dalam Metode Use Case Point**

- [10] Kashyap, D., Shukla, D., and Misra, A., K., (2014), “ Refining The Use Case Classification, Foruse Case Point Method For Software Effort Estimation”, in ACEEE Proc. of Int. Conf. on Recent Trends in Information, Telecommunication and Computing, ITC, DOI: 02.ITC.2014.5.501, C Association of Computer Electronics and Electrical Engineers, 2014.
- [11] Kirmani, M., M., and Wahid, A., (2015a), “ Use Case Point Method Of Software Effort Estimation A Review”, in International Journal of Computer Applications (0975 – 8887) Volume 116 – No. 15, April 2015, Pages 43-47, IJCATM : [www.ijcaonline.org](http://www.ijcaonline.org)
- [12] Kirmani, M., M., and Wahid, A., (2015b), “ Use Case Point And E-

Use Case Point Method Of Software Effort Estimation A Critical Performance Comparison”, in International Journal of Computer Application (2250-1797) Volume 5– No. 3, April 2015, pages 55-64.

- [13] Satapathya, S., M., and Rathb, S., K., (2014), “ Use Case Point Approach Based Software Effort Estimation Using Various Support Vector Regression Kernel Methods”, in ResearchGate arXiv:1401.3069v2 [cs.SE] 15 Jan 2014, Retrieved on: 27 July 2015, <http://www.researchgate.net/publication/259742858>.
- [14] Walia, I., K., and Kaur, M., (2014), “ Combining Cocomo And Use Case For Better Effort Estimation”, in International Journal of Current Engineering and Technology Vol.4, No.2 (April 2014), pages 576-578, E-ISSN 2277 – 4106, P-ISSN 2347 – 5161, ©2014 INPRESSCO®, All Rights Reserved, Available at <http://inpressco.com/category/ijcet>.
- Faktor Usaha dalam Konsep CBSD dan Software Reuse**
- [15] Batra, G., Kuntal Barua, K., and Dr. Rawat, M., K., (2014), “ A Minimization Of Software Cost And Effort Estimation Using Code Reusability Concept By Analogy Estimation Technique”, in Engineering Universe for Scientific Research and Management (International Journal), Impact Factor: 3.7, Vol. 6 Issue 4, April 2014, Paper ID: 014/EUSR/4/2014/7593.
- [16] Jahanzaib Khan, J., and Khanum, A., (2014), “ Lifecycle Effort Estimation For Component Based Software Engineering A Model And Its Soft Computing Based Implementation”, in Life Science Journal 2014;11(5) <http://www.lifesciencesite.com>, 3/11/2014, pages 145-155
- Faktor Usaha dalam Biaya, Tim, dan Waktu Pengembang PL**
- [17] Bozhikova, V., T., and Stoeva, T., S., (2014), “ Search-Based Approach For Software Cost Estimation”, in ANNUAL JOURNAL OF ELECTRONICS, 2014, ISSN 1314-0078, pages 20-23.
- [18] Buchholz, S., and Sisk, D., (2014), “Lowering The It Debt Ceiling”, in Tech Trends 2014, Technical Debt Reversal, Deloitte University Press, Download the full report at [www.deloitte.co.uk/techtrends](http://www.deloitte.co.uk/techtrends). UK Edition © 2014 Deloitte MCS Limited. All rights reserved.
- [19] Guzman, J., C., Chiozzi, G., Bridger, A., and Ibsen, J., (2014), “ The Cost Of Developing And Maintain The Monitoring And Control Software Of Large Ground-Based Telescopes”, in Software and Cyberinfrastructure for Astronomy III, edited by Gianluca Chiozzi, Nicole M. Radziwill, Proc. of SPIE Vol. 9152, 91521P1-6 © 2014 SPIE · CCC code: 0277-786X/14/\$18, doi: 10.1117/12.2055921.
- [20] Islam, M., and Katiyar, V., (2014), “ Development Of A Software Maintenance Cost Estimation Model”, in International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 2, Issue 6 (Nov-Dec 2014), PP. 65-68.
- [21] Kumari, K., B., M., (2014), “ Software Cost Estimation Techniques”, in International Journal of Emerging Research in Management & Technology ISSN: 2278-9359 (Volume-3, Issue-4), Research Article April 2014, pages 104-108.
- [22] Malathi, S., and Lijin, B., S., (2014), “ An Efficient Method For The Estimation Of Effort In Software Cost”, in International Journal of Advance Research in Computer Science and Management Studies Volume 2, Issue 2, February 2014, ISSN: 2321-7782 (Online) © 2014, IJARCSMS All Rights Reserved pages 330-335.
- [23] Maleki, I., Gharehchopogh, F., S., Ayat, Z., Ebrahimi, L., (2014), “ A Novel Hybrid Model Of Scatter Search And Genetic Algorithms For Software Cost Estimation”, in MAGNT Research

- Report (ISSN. 1444-8939) Vol. 2(6): PP. 359-371, (DOI: dx.doi.org/14.9831/1444-8939.2014/2-6/MAGNT.49).
- [24] Mehdi, R.,A.,K., (2015), “ The Effect Of Dimensionality Reduction On The Performance Of Software Cost Estimation Models”, in IJEIT International Journal of Engineering and Innovative Technology (IJEIT) Volume 4, Issue 9, March 2015, ISSN: 2277-3754 ISO 9001:2008 Certified, pages 68-72.
- [25] Navjot Bagla, N., and Sehra, S., K., (2014), “ Investigating Relationship Between Software Effort Estimation And Team Parameters”, in INNOVATIVE RESEARCH ORGANISATION International Journal of Advance Research in Education, Technology & Management (Scholarly Peer Review Publishing System), Vol.2, No.1, July 2014, ISSN: 2349-0012, pages 139-142.
- [26] Omnext (2014), “ How To Save On Software Maintenance Costs”, in An Omnext white paper on software quality, November 2014 © 2014 Omnext BV.
- [27] Singh, K., and Dwivedi, U., (2014), “ A Survey Of Various Cost & Effort Estimation Models”, in International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 8, August 2014 ISSN: 2277 128X, Research Paper Available online at: www.ijarcsse.com, © 2014, IJARCSSE All Rights Reserved, pages 1113-1116.
- [28] Sonam, S., Bawa, A., Attri, V., K., (2015), “ A Review On Genetic Algorithm To Deal With Optimization Of Parameters Of Constructive Cost Model”, in International Journal of Advanced Research in Computer and Communication Engineering, Vol. 4, Issue 4, April 2015, ISSN (Online) 2278-1021, ISSN (Print) 2319-5940, Copyright to IJARCSSE DOI 10.17148/IJARCSSE.2015.4491, page 405-408.
- [29] Tailor, O., Saini, J., and Rijwani, P., (2014), “ Comparative Analysis Of Software Cost And Effort Estimation Methods A Review”, In Omprakash Tailor Et Al, International Journal Of Computer Science And Mobile Computing ISSN 2320–088x, Vol.3 Issue.4, April- 2014, Pg. 1364-1374, A Monthly Journal Of Computer Science And Information Technology © 2014, Ijcsmc All Rights Reserved.
- [30] Thomas, P., S., and Thomas, S., (2014), “ Ten Golden Rules For Cost Saving In Software”, in IMPACT: International Journal of Research in Engineering & Technology (IMPACT: IJRET), ISSN(E): 2321-8843; ISSN(P): 2347-4599, Vol. 2, Issue 3, Mar 2014, © Impact Journals, Impact Factor(JCC): 1.3268 - This article can be downloaded from www.impactjournals.us, pages 25-29.
- [31] Waghmode, S., and Kolhe, K., (2014), “ A Novel Way Of Cost Estimation In Software Project Development Based On Clustering Techniques”, in International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization), Vol. 2, Issue 4, April 2014, ISSN(Online): 2320-9801, ISSN (Print): 2320-9798, Copyright to IJIRCCE www.ijircce.com, pages 3892-3899.

#### **Faktor Usaha pada Pengembangan PL di Beberapa Negara**

- [32] Buffett, B., (2014), “ Factors Influencing Open Source Software Adoption In Public Sector National And International Statistical Organisations”, in Meeting on the Management of Statistical Information Systems (MSIS 2014), (Dublin, Ireland and Manila, Philippines 14-16 April 2014), Topic (i): How IT can contribute to changing organizational culture.
- [33] Egbokhare, F., A., (2014), “ Causes Of Softwareinformation Technology Project Failures In Nigerian Software Development Organizations”, in IEEE African Journal of Computing & ICT, Vol 7. No. 2 - June, 2014, © 2014 Afr J Comp & ICT – All Rights Reserved - ISSN

2006-1781, [www.ajocict.net](http://www.ajocict.net), pages 107-110.

- [34] Fernando, W., K., S., D., Wijayarathne, D., G., S., M., Fernando, J., S., D., Mendis, M., P., L., and Guruge, I., (2014), "The Importance Of Software Metrics Perspective Of A Software Development Projects In Sri Lanka", in SAITM Research Symposium on Engineering Advancements 2014 (SAITM – RSEA 2014), pages 91-95.

#### **Faktor Usaha dalam Defect PL**

- [35] Hemmati, H., Nagappan, M., Hassan, A., E., (2014), "Investigating The Effect Of Defect Co-Fix On Quality Assurance", in ELSEVIER, available online at [www.sciencedirect.com](http://www.sciencedirect.com), Journal of Systems and Software 00 (2014) 1–18.
- [36] Rahmana, M., M., Karima, M., R., Ruhea, G., Garousi, V., Zimmermann, T., (2015), "An Empirical Investigation Of A Genetic Algorithm For Developer's Assignment To Bugs", in ELSEVIER, available online at [www.sciencedirect.com](http://www.sciencedirect.com), First North American Search Based Software Engineering Symposium.

#### **Faktor Usaha dalam Metode Fuzzy**

- [37] Ganesh, M., K., S. and Thanuskhodi, K., (2015), "An Efficient Software Cost Estimation Technique Using Fuzzy Logic With The Aid Of Optimization Algorithm", in International Journal of Innovative Computing, Information and Control Volume 11, Number 2, April 2015, ICIC International@2015 ISSN 1349-4198, pages 587-597.
- [38] Hamdy, A., (2014), "Genetic Fuzzy System For Enhancing Software Estimation Models", in International Journal of Modeling and Optimization, Vol. 4, No. 3, June 2014, Manuscript received October 9, 2013; revised December 12, 2013. Abeer Hamdy is with the Electronics Research Institute and British University, Egypt (e-mail: [Abeer.hamdy@bue.edu.eg](mailto:Abeer.hamdy@bue.edu.eg)), DOI: 10.7763/IJMO.2014.V4.378, pages 227-232.

- [39] Jabeen, S., K., Arthi, B., and Vani, V., (2014), "Software Effort Estimation For Size Metric Framework Modelling Using Loc And Fp Oriented Estimation Models And Fuzzy Logic Approach", in IJAREEIE International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297: 2007 Certified Organization) Vol. 3, Special Issue 2, April 2014, Copyright to IJAREEIE, [www.ijareeie.com](http://www.ijareeie.com), pages 457-467.
- [40] Kumar, M., S., and Rajan, B., C., (2014), "Experimental Evaluation Of Fuzzy- Based Function Point Analysis For Software Effort Estimation", in Journal of Theoretical and Applied Information Technology, 20th September 2014. Vol. 67 No.2 © 2005 - 2014 JATIT & LLS. All rights reserved., ISSN: 1992-8645 [www.jatit.org](http://www.jatit.org) E-ISSN: 1817-3195, pages 498-503.
- [41] Maurya, V., N., Bathla, R., K., Maurya, E., A., K., Arora, A., K., (2014), "New Fuzzy Logic Model For Effort Estimation In Software Module Development", in Journal of Engineering And Technology Research, 2014, 2 (1):10-16, Available online at [www.scientiaresearchlibrary.com](http://www.scientiaresearchlibrary.com), Scientia Research Library ISSN 2348-0424, USA CODEN: JETRB4.
- [42] Preet, R., Shivakumar, N., and Balaji, N., (2014), "Software Effort Estimation Using Attribute Refinement Based Adaptive Neuro Fuzzy Model", in International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET), Volume 3, Special Issue 3, March 2014, ISSN (Online) : 2319 - 8753, ISSN (Print) : 2347 - 6710, 2014 International Conference on Innovations in Engineering and Technology (ICIET'14), On 21st & 22nd March Organized by K.L.N. College of Engineering, Madurai, Tamil Nadu, India.
- [43] Raslan, A., T., Darwish, N., R., and Hefny, A., A., (2015), "Towards A Fuzzy Based Framework For Effort

- Estimation In Agile Software Development”, in (IJCSIS) International Journal of Computer Science and Information Security, Vol. 13, No. 1, 2015, <http://sites.google.com/site/ijcsis/>, ISSN 1947-5500, pages 37-45.
- [44] Rizvi, S., Abbas, S., Q., and Beg, R., (2014), “ A Hybrid Fuzzy-Ann Approach For Software Effort Estimation”, in International Journal in Foundations of Computer Science & Technology (IJFCST), Vol.4, No.5, September 2014, DOI:10.5121/ijfcst.2014.4505, pages 45-56.
- [45] Seref, B., and Barisci, N., (2014), “ Software Effort Estimation Using Multilayer Perceptron And Adaptive Neuro Fuzzy Inference System”, in International Journal of Innovation, Management and Technology, Vol. 5, No. 5, October 2014, DOI: 10.7763/IJIMT.2014.V5.543, pages 374-377.
- [46] Shifali and Bilandi, N., (2014), “ Software Development Effort Estimation Using Fuzzy Logic A Review”, in Shifali et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (3) , 2014, 2841-2845, [www.ijcsit.com](http://www.ijcsit.com), ISSN:0975-9646.
- [47] Veeranjanyulu, N., Suresh, S., Salamuddin, S., K., and Kim, H., J., (2014), “ Software Cost Estimation On E-Learning Technique Using A Classical Fuzzy Approach”, in International Journal of Software Engineering and Its Applications, Vol. 8, No. 11 (2014), pp. 217-222, <http://dx.doi.org/10.14257/ijseia>. 2014.8.11.20, ISSN: 1738-9984 IJSEIA, Copyright © 2014 SERSC.
- [48] Verma, A., Patel, S., and Jaiswal, A., (2014), “ A Project Estimator Tool For Software Estimation Using Neuro-Fuzzy”, in International Journal of Emerging Trends & Technology in Computer Science (IJETTCS), Volume 3, Issue 3, May – June 2014 ISSN 2278-6856, Web Site: [www.ijettcs.org](http://www.ijettcs.org) Email: [editor@ijettcs.org](mailto:editor@ijettcs.org), page 9-13.
- Faktor Usaha dalam Metrik PL**
- [49] Chadha, R., and Nagpal, S., (2014), “ Optimization Of Cocomoii Model Coefficients Using Tabu Search”, in International Journal of Science and Research (IJSR) Volume 3 Issue 8, August 2014, ISSN (Online): 2319-7064, Impact Factor (2012): 3.358, [www.ijsr.net](http://www.ijsr.net), Paper ID: 02015254, pages 725-728.
- [50] Huijgens, H., Gousios, G., and Deursen, A., V., (2014), “ Pricing Via Functional Size A Case Study Of 77 Outsourced Projects”, in Delft University of Technology, Software Engineering Research Group, Technical Report Series, Report TUD-SERG-2014-012, TUD-SERG-2014-012, ISSN 1872-5392.
- [51] Jones, C., (2014), “ The Mess Of Software Metrics”, in Namcook Analytics LLC, Version 2.0 September 12, 2014, Copyright © 2014 by Capers Jones. All rights reserved.
- [52] Khuttan, A., Kumar, A., dan Singh, A., (2014), “ A Survey Of Effort Estimation Techniques For The Software Development”, in International Journal Of Scientific & Technology Research Volume 3, Issue 7, July 2014, Issn 2277-8616, Ijstr©2014, [www.ijstr.org](http://www.ijstr.org), pages 234-236.
- [53] Lavazza, L., Morasca, S., and Tosi, D., (2014), “ On The Ability Of Functional Size Measurement Methods To Size Complex Software Applications”, in ICSEA 2014 : The Ninth International Conference on Software Engineering Advances, Copyright (c) IARIA, 2014. ISBN: 978-1-61208-367-4, pages 404-409.
- [54] Soniya, A., and Ratadiya, P., (2014), “ A New Way To Estimate The Size And Effort Of Software For Expert User Programming”, in International Journal of Technology Research and Management, ISSN (Online): 2348-9006, Vol 1 Issue 2 May 2014, Paper ID: IJTRM/01/02/1019.



- [55] Zephyr (2014), “ Qa Metrics The Value Of Testing Metrics Within Software Development”, in White Paper Zephyr Real-Time Test Management, [www.getzephyr.com](http://www.getzephyr.com), +1-510-400-8656

#### **Faktor Usaha dalam Metode Neural Network**

- [56] Bautista, A., M., Castellanos, A., and Feliu, T., S., (2014), “ Software Effort Estimation Using Radial Basis Function Neural Networks”, in International Journal “Information Theories and Applications”, Vol. 21, Number 4, 2014, pages 319-327.
- [57] Gharehchopog, F., S., and Maroufi, A., (2014), “ Approach Of Software Cost Estimation With Hybrid Of Imperialist Competitive And Artificial Neural Network Algorithms”, in Journal of Scientific Research and Development, 1 (1) 2014,ISSN 1115-756, Available online at [www.jsrad.org](http://www.jsrad.org), Pages: 50-57.
- [58] Khan, M., W., and Qureshi, I., (2014), “ Neural Network Based Software Effort Estimation A Survey”, in Int. J. Advanced Networking and Applications, Volume: 05, Issue: 04, Pages:1990-1995 (2014) ISSN : 0975-0290, pages 1990-1995.
- [59] Rajput, P., K., Sikka, G., and Aarti (2014), “ Cgann-Clustered Genetic Algorithm With Neural Network For Software Cost Estimation”, in International Conference on Advances in Engineering and Technology (ICAET'2014) March 29-30, 2014 Singapore, <http://dx.doi.org/10.15242/IEE.E0314125> , pages 268-272.
- [60] Subitsha, P., and Rajan, J., K., (2014), “ Artificial Neural Network Models For Software Effort Estimation”, in International Journal Of Technology Enhancements And Emerging Engineering Research, Vol 2, Issue 4, ISSN 2347-4289, Copyright © 2014, IJTEEE.Pages 76-80.
- [61] Yadav, C., S., and Singh, R., (2014a), “ Implementation Of Prediction Model For Object Oriented Software Development Effort Estimation Using One Hidden Layer Neural Network”, in International Journal of Advanced Computer Research (ISSN (print): 2249-7277 ISSN (online): 2277-7970), Volume-4 Number-1 Issue-14 March-2014, pages 156-165.
- [62] Yadav, C., S., and Singh, R., (2014b), “ Research Article Prediction Model For Object Oriented Software Development Effort Estimation Using One Hidden Layer Feed Forward Neural Network With Genetic Algorithm”, in Advances in Software Engineering Volume 2014, Article ID 284531, Hindawi Publishing Corporation, 6 pages, <http://dx.doi.org/10.1155/2014/284531>.

#### **Faktor Usaha dalam Konsep Pengembangan PL Berbasis *Object Oriented***

- [63] Farrag, E. A., and Moawad., R., (2014), “ Phased Effort Estimation Of Legacy Systems Migration To Service Oriented Architecture”, in International Journal of Computer and Information Technology (ISSN: 2279 – 0764), Volume 03 – Issue 03, May 2014, [www.ijcit.com](http://www.ijcit.com), pages 661-670.
- [64] Mwangi, W., Waweru, S., N., and Joseph, W., (2014), “ An Effort Prediction Framework For Software Code Quality Measurement Based On Quantifiable Constructs For Object Oriented Design”, in International Journal of Computer Trends and Technology (IJCTT) – volume 10 number 1 – Apr 2014, ISSN: 2231-2803 <http://www.ijcttjournal.org>, pages 36-52.
- [65] Rao, M., U., and Achutharao, A., (2014), “ Effort Estimation For Object-Oriented System Using Artificial Intelligence Techniques”, in International Journal & Magazine Of Engineering, Technology, Management And Research, Volume No: 1(2014), Issue No: 10 (October) ISSN No: 2348-4845, A Monthly Peer Reviewed Open

Access International e-Journal  
www.ijmetmr.com Page 248-252.

- [66] Yadav, C., S., and Singh, R., (2014), "Implementation Of Prediction Model For Object Oriented Software Development Effort Estimation Using One Hidden Layer Neural Network", in International Journal of Advanced Computer Research (ISSN (print): 2249-7277 ISSN (online): 2277-7970), Volume-4 Number-1 Issue-14 March-2014, pages 156-165.

#### Faktor Usaha dalam Metode Semantic

- [67] Helali, R., G., M., (2015), "A Comparison Between Semantic And Syntactic Software Metrics", in International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 2, February 2015, ISSN (Online) : 2278-1021, ISSN (Print) : 2319-5940, Copyright to IJARCCCE DOI 10.17148/IJARCCCE1-5.
- [68] Koch, M., Ring, M., Otto, F., and Landes, D., (2014), "Combining Statistical And Semantic Data Sources For The Improvement Of Software Engineering Courses", in Proceedings of the 7th International Conference on Educational Data Mining, pages 341-342.
- [69] Stabauer, M., Quirchmayr, G., and Höller, J., (2015), "An Integration Of Software Engineering Methods And Semantic Technologies For Drafting And Modeling Statutes And Legal Rules", in Proceedings of the 38th Australasian Computer Science Conference (ACSC 2015), Sydney, Australia, 27 - 30 January 2015, CRPIT Volume 159 - Computer Science 2015, pages 9-15.
- [70] Upadhyay, A., Paul, A., Pramanik, P., K., D., (2014), "Semantic Web Crawler For More Relevant Search Using Ontology", in International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 12, December 2014 ISSN: 2277 128X, Research Paper Available online at: www.ijarcsse.com © 2014, IJARCSSE All Rights Reserved, pages 958-962.

#### Tren IT 2015

- [71] Gartner, (2014), "Gartner Identifies the Top 10 Strategic Technology Trends for 2015", Press Release Orlando, Fla. , October 8, 2014, [www.gartner.com/newsroom/id/2867917](http://www.gartner.com/newsroom/id/2867917).

#### Dataset

- [72] Jatimprov, (2015), "Daftar Umk Jatim 2015" <http://www.jatimprov.go.id/site/ini-daftar-umk-jatim-2015>.
- [73] Kelly Services Indonesia (2015), "Indonesia Salary Guide 14/15", [www.kellyservices.co.id/ID/Salary-guide/?terms=guide](http://www.kellyservices.co.id/ID/Salary-guide/?terms=guide).
- [74] Robert Walters Indonesia (2015), "The 2015 Global Salary Survey", [www.robertwalters.co.id/career-advice/salary-survey.html](http://www.robertwalters.co.id/career-advice/salary-survey.html).

#### Faktor Usaha dalam Banyak Penelitian

- [75] Erasmus, P., and Daneva, M., (2015), "An Experience Report On Erp Effort Estimation Driven By Quality Requirements", this volume is published and copyrighted by its editors. pages 136-139. Copyright © 2015 by the authors. Copying permitted for private and academic purposes.
- [76] Felipe, N., F., Cavalcanti, R., P., Maia, E., H., B., Amaral, W., P., Farnese, A., C., Tavares, L., D., Faria, E., S., J., D., Padua, C., I., P., D., S., Filho, W., D., P., P., (2014), "A Comparative Study Of Three Test Effort Estimation Methods", in Revista Cubana de Ciencias Informáticas Vol. 8, No. Especial UCIENCIA 2014, Mayo, 2014, ISSN: 2227-1899 | RNPS: 2301, Pág. 1-13. <http://rcci.uci.cu>, Grupo Editorial "Ediciones Futuro", Temática: Ingeniería y Gestión de Software, Recibido: 7/05/2014 | Aceptado: 21/05/2014.
- [77] Han, W., Lu, T., Zhang, X., Jiang, L., and Li, W., (2015), "Algorithmic Based And Non-Algorithmic Based Approaches To Estimate The Software Effort", in International Journal of Multimedia and

- Ubiquitous Engineering Vol.10, No.4 (2015), pp.141-154, <http://dx.doi.org/10.14257/ijmue.2015.10.4.15>, ISSN: 1975-0080 IJMUE, Copyright © 2015 SERSC.
- [78] Jakhar, A., K., and Rajnish, K., (2015), “ An Empirical Approach For Estimation Of The Software Development Effort”, in International Journal of Multimedia and Ubiquitous Engineering Vol. 10, No. 2 (2015), pp. 97-110, <http://dx.doi.org/10.14257/ijmue.2015.10.2.09>, ISSN: 1975-0080 IJMUE, Copyright © 2015 SERSC.
- [79] Jørgensen, M., (2014a), “ The Ignorance of Confidence Levels in Minimum-Maximum Software Development Effort Intervals”, in Lecture Notes on Software Engineering, Vol. 2, No. 4, November 2014, DOI: 10.7763/LNSE.2014.V2.144, pages 327-330.
- [80] Jørgensen, M., (2014b), “ What We Do And Don't Know About Software Development Effort Estimation”, in IEEE MARCH/APRIL 2014 IEEE Software [www.computer.org/software@ieeesoftware](http://www.computer.org/software@ieeesoftware), pages 37-40.
- [81] Jha, A., K., Puvvala, A., Rai, V., K., Mehta, S., and Vin, H., M., (2014), “ An Agent Based Approach For Effort Estimation In Production Support”, in 25th Australasian Conference on Information Systems Effort Estimation for Production Support Planner 8th - 10th Dec 2014, Auckland, New Zealand Jha et al.
- [82] Keerthiga, M., Thirunavukarasu, B., and Prasanneswar, R., (2014), “ Global Journal Of Engineering Science And Researches Effort Estimation For Software Package Promotion”, in (C)JESR, Global Journal Of Engineering Science And Researches, [Keerthiga, 1(7): Sep, 2014] ISSN 2348 – 8034.
- [83] Kumari, P., Bakshi, N., and Pathania, Y., (2015), “ Test Effort Estimation And Its Techniques”, in International Journal For Technological Research In Engineering Volume 2, Issue 8, April-2015. ISSN (Online): 2347 – 4718. Copyright 2015. All rights reserved., [www.ijtre.com](http://www.ijtre.com). Pages 1514-1516.
- [84] Lazic, L., Dokic, I., and Milinkovic, S., (2014), “ Challenges In Estimating Software Testing Effort”, in Infotech-Jahorina Vol. 13, March 2014. pages 637-642.
- [85] Liyan Song, L., Minku, L., L., and Yao, X., (2014), “ The Potential Benefit Of Relevance Vector Machine To Software Effort Estimation”, in ACM 978-1-4503-2898-2/14/09., PROMISE '14, Sep 17-17 2014, Torino, Italy, [dx.doi.org/10.1145/2639490.2639510](http://dx.doi.org/10.1145/2639490.2639510).
- [86] Lukasz, R., (2014), “ How Software Development Factors Influence User Satisfaction In Meeting Business Objectives And Requirements”, in Software Engineering from Research and Practice Perspective (Eds. Lech Madeyski, M. Ochodek), pp. 101---120, Scientific Papers of the Polish Information Processing Society Scientific Council, ISBN 978---83---63919---16---0, 2014.
- [87] Mahapatra, H., B., and Goswami, B., (2015), “ Selection Of Software Development Methodology (Sdm) A Comparative Approach International Journal of Advanced Research in Computer Science and Software Engineering Volume 5, Issue 3, March 2015, ISSN: 2277 128X, Research Paper Available online at: [www.ijarcsse.com](http://www.ijarcsse.com). © 2015, IJARCSSE All Rights Reserved, pages 58-61.
- [88] Manju, K., P., and Arthi M., E., B., (2014), “ International Journal Of Advanced Research In Electrical, Electronics And Instrumentation Engineering”, in International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297: 2007 Certified Organization), Vol. 3, Special Issue 2, April 2014, ISSN (Print) : 2320 – 3765, ISSN (Online): 2278 – 8875, Copyright to IJAREEIE [www.ijareeie.com](http://www.ijareeie.com), pages 240-246.

- [89] Margolies, R., Gorlatova, M., Sarik, J., Kinget, P., Kymissis, I., and Zussman, G., (2014), "Project-Based Learning Within A Large-Scale Interdisciplinary Research Effort", in arXiv:1410.6935v1 [cs.CY] 25 Oct 2014, 6 pages.
- [90] Nagar, C., and Dixit, A., (2014), "Multi Stage Software Project Effort Estimation", in International Journal of Advanced Trends in Computer Science and Engineering, Volume 3, No.1, January – February 2014, Available Online at <http://warse.org/pdfs/2014/ijatcse03312014.pdf>, ISSN 2278-3091.
- [91] Nagpal, G., Uddin, M., and Kaur, A., (2014), "Grey Relational Effort Analysis Technique Using Regression Methods For Software Estimation", in The International Arab Journal of Information Technology, Vol. 11, No. 5, September 2014.
- [92] Nasar, M., D., Johri, P., and Chanda, U., (2014), "Dynamic Effort Allocation Problem Using Genetic Algorithm Approach", in I.J. Modern Education and Computer Science, 2014, 6, 46-52, Published Online June 2014 in MECS (<http://www.mecspress.org/>), DOI: 10.5815/ijmeecs.2014.06.06, Copyright © 2013 MECS I.J.
- [93] Peng, R., Li, Y., F., Zhang, W., J., and Hu, Q., P., (2014), "Testing Effort Dependent Software Reliability Model For Imperfect Debugging Process Considering Both Detection And Correction", in ELSEVIER, Contents lists available at ScienceDirect, journal homepage: [www.elsevier.com/locate/ress](http://www.elsevier.com/locate/ress), 0951-8320/\$-see front matter & 2014, pages 37–43.
- [94] Priya, N., P., and Vidyabharathi, D., (2014), "Scott Knott Test Based Effective Software Effort Estimation Through A Multiple Comparison Algorithms", in International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization) Vol.2, Special Issue 1, March 2014, Proceedings of International Conference On Global Innovations In Computing Technology (ICGICT'14), Organized by Department of CSE, JayShriram Group of Institutions, Tirupur, Tamilnadu, India on 6th & 7th March 2014, ISSN(Online): 2320-9801, ISSN (Print): 2320-9798, Copyright @ IJRCCE [www.ijrcce.com](http://www.ijrcce.com), pages 2257-2262.
- [95] Rijwani, P., Jain, S., and Santani, D., (2014), "Software Effort Estimation A Comparison Based Perspective", in International Journal of Application or Innovation in Engineering & Management (IJAIEM), Web Site: [www.ijaiem.org](http://www.ijaiem.org) Email: [editor@ijaiem.org](mailto:editor@ijaiem.org), Volume 3, Issue 12, December 2014 ISSN 2319 - 4847, pages 18-29.
- [96] Robles, G., Barahona, J., M., G., Cervigón, C., Capiluppi, A., and Cortázar, D., I., (2014), "Estimating Development Effort In Freopen Source Software Projects By Mining Software Repositories A Case Study Of Openstack", in Proceedings of the 11th, Working Conference on Mining Software Repositories (MSR'14), MSR '14, 10 pages.
- [97] Satapathy, S., M., Acharya, B., P., and Rath, S., K., (2015), "Early Stage Software Effort Estimation Using Random Forest Technique Based On Optimized Class Point Approach", in INFOCOMP, v. 13, no. 2, p. 22-33, December 2014.
- [98] Sharma, A., Vardhan, M., dan Kushwaha, D., S., (2014), "A Versatile Approach For The Estimation Of Software Development Effort Based On Srs Document", in International Journal of Software Engineering and Knowledge Engineering Vol. 24, No. 1 (2014) 1–42 #c World Scientific Publishing Company, DOI: 10.1142/S0218194014500016.
- [99] Sharma, M., and Fotedar, N., (2014), "Software Effort Estimation With Data Mining Techniques- A Review", in International Journal Of Engineering Sciences & Research Technology, IJESRT, ISSN: 2277-

- 9655, Impact Factor: 1.852, [Sharma, 3(3): March, 2014], [www.ijesrt.com](http://www.ijesrt.com)(C)International Journal of Engineering Sciences & Research Technology.
- [100] Sholiq, Sutanto, T., Widodo, A., P., And Kurniawan, W., (2014), “Effort Rate On Use Case Point Method For Effort Estimation Of Website Development”, in Journal of Theoretical and Applied Information Technology 10 th, May 2014. Vol. 63 No.1, © 2005 - 2014 JATIT & LLS. All rights reserved. ISSN: 1992-8645 [www.jatit.org](http://www.jatit.org) E-ISSN: 1817-3195, pages 209-2018.
- [101] Souza, L., S., and Aquino Jr., G., S., (2014), “Estimating The Effort Of Mobile Application Development”, in Computer Science & Information Technology (CS & IT)CSE, DBDM, CCNET, AIFL, SCOM, CICS, CSIP – 2014, pp. 45–63, 2014. © CS & IT-CSCP 2014 DOI : 10.5121/csit.2014.4405.
- [102] T., M., K., and Jayaram, M., A., (2014), “Compendium Of Software Cost And Effort Estimation Techniques”, in IJITKMI Volume 7 • Number 2 • Jan– June 2014 pp. 37-41 (ISSN 0973-4414).
- [103] Urbanek, T., Prokopova, Z., and Silhavy R., (2014), “On The Usage Of Differential Evolution For Effort Estimation”, in Latest Trends on Systems - Volume II, ISBN: 978-1-61804-244-6, pages 632-635.
- [104] Venaik, A., (2015), “Qualitative Risk Level Estimation Of Business Process Re-Engineering Efforts And Effects (With Special Reference To It-Sector) “, in International Journal of Advanced Computer Research Volume-5 Issue-18 March-2015, ISSN (Print): 2249-7277 ISSN (Online): 2277-7970. pages 11-18.
- [105] Whigham, P., A., Owen, C., A., and MacDonell, S., G., (2015), “A Baseline Model For Software Effort Estimation”, in ACM Transactions on Software Engineering and Methodology, Vol. 24, No. 3, Article 20, Pub. date: May 2015, 11 pages. DOI: <http://dx.doi.org/10.1145/2738037>.
- [106] Asten , D., and Sunyaev, A., (2014), “ A Systematic Mapping Of Factors Affecting Accuracy Of Software Development Effort Estimation”, in Communications of the Association for Information Systems (CAIS), Volume 34, Article 4, pp. 51-86, January 2014.
- [107] Bardsiri, A., K., and Hashemi, S., M., (2014), “ Software Effort Estimation A Survey Of Well-Known Approaches”, in International Journal of Computer Science Engineering (IJCSE), ISSN :2319-7323, Vol. 3 No.01 Jan 2014, pages 46-50.
- [108] Basri, S., Kama, N., and Ibrahim, R., (2015), “ A Novel Effort Estimation Approach For Requirement Changes During Software Development Phase”, in International Journal of Software Engineering and Its Applications Vol. 9, No. 1 (2015), pp. 237-252, [dx.doi.org/10.14257/ijseia.2015.9.1.21](http://dx.doi.org/10.14257/ijseia.2015.9.1.21), ISSN: 1738-9984 IJSEIA, Copyright © 2015 SERSC.
- [109] Borglund, E., A., M., and Öberg, L., M., (2014), “Creation Of An Exercise Scenario A Collaborative Design Effort”, in Proceedings of the 11th International ISCRAM Conference – University Park, Pennsylvania, USA, May 2014. S.R. Hiltz, M.S. Pfaff, L. Plotnick, and P.C. Shih, eds. pages 488-492.
- [110] Daniel and George, (2014), “Effort Estimation In Quotation Phase Of Complex Projects Development”, in Annals Of The Oradea University, Fascicle of Management and Technological Engineering, ISSUE #1, MAY 2014, [www.imtuoradea.ro/auo.fmte](http://www.imtuoradea.ro/auo.fmte), pages 243-248.
- [111] Derntl, M., Renzel, D., Nicolaescu, P., Koren, I., and Klamma, R., (2015), “ Distributed Software Engineering In Collaborative Research Projects”, in Proceedings of the 10th International Conference on Global Software Engineering (ICGSE 2015)@Copyright 2015 IEEE, 5 pages.

- [112] Divya, A., dan Mahalakshmi, S., D., (2014), “ An Efficient Framework For Unified Automation Testing A Case Study On Software Industry”, in International Journal of Advanced Research in Computer Science & Technology (IJARCST 2014) Vol. 2 Issue Special 1 Jan-March 2014, www.ijarcst.com, ISSN : 2347 - 8446 (Online), ISSN : 2347 - 9817 (Print), © All Rights Reserved, IJARCST 2014 pages 15-19.
- [113] Eberendu, A., C., (2014), “ Software Project Cost Estimation Issues, Problems And Possible Solutions”, in International Journal of Engineering Science Invention, ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726, www.ijesi.org, pages 38-43.